View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by PhilPapers

Inferentialism*

Julien Murzi and Florian Steinberger†

December 14, 2015

Abstract: This article offers an overview of inferential role semantics. We aim to provide a map of the terrain as well as challenging some of the inferentialist's standard commitments. We begin by introducing inferentialism and placing it into the wider context of contemporary philosophy of language. §2 focuses on what is standardly considered both the most important test case for and the most natural application of inferential role semantics: the case of the logical constants. We discuss some of the (alleged) benefits of logical inferentialism, chiefly with regards to the epistemology of logic, and consider a number of objections. §3 introduces and critically examines the most influential and most fully developed form of global inferentialism: Robert Brandom's inferentialism about linguistic and conceptual content in general. Finally, in §4 we consider a number of general objections to IRS and consider possible responses on the inferentialist's behalf.

Keywords: Inferentialism, inferential role semantics, logical inferentialism, use-theory of meaning, (proof-theoretic) harmony, Robert Brandom.

There are two *prima facie* opposing tendencies in philosophical work concerning linguistic meaning and mental content: 'referential' approaches and 'use-theoretic' approaches. According to referential approaches the semantic properties of linguistic expressions and concepts are primarily to be explained in terms of the (broadly) referential relations they bear to (typically) extra-linguistic things (objects, sets thereof, instantiations of properties, etc.). In

*Many thanks to Alex Miller for very helpful comments on a first draft of this paper. Over the years, we have greatly benefited from conversations we had with a number of friends and colleagues on inferentialism and related topics. We'd like to thank in particular Corine Besson, Paul Boghossian, Cesare Cozzo, Salvatore Florio, Bob Hale, Dominic Gregory, Ole T. Hjortland, Luca Incurvati, Rosanna Keefe, Hannes Leitgeb, Dag Prawitz, Stephen Read, Ian Rumfitt, Gil Sagi, Neil Tennant, Tim Williamson, and Crispin Wright.

†[University of Salzburg, julien.murzi@sbg.ac.at & Birkbeck College, Florian.Steinberger@bbk.ac.uk]

the case of language, referential relations are understood in terms of mappings from linguistic expressions to the corresponding semantic values in accordance with their semantic types: proper names are mapped onto the appropriate objects, simple predicates might be associated with the properties they designate, and so on. Our use of linguistic expressions is then explained *in terms* of these referential semantic properties: we use the expressions of our language as we do because of their referential properties. A roughly analogous story, it is generally thought, can be told about thought. Use theories of meaning, in contrast, reverse the order of explanation. According to them, it is regularities or rules of use that take center stage. It is these regularities and rules that are accorded explanatory primacy in accounting for meaning and conceptual content, and customary semantic notions such as reference, truth and satisfaction are explained as a by-product of them. Thus, linguistic practice precedes and shapes semantic theory rather than the other way around.

Plausibly, on a use-theoretic approach, not all aspects of an expression's or a concept's use are equally explanatorily relevant. Accordingly, use theories of meaning differ over which features of an expression's use does most of the explanatory work. Our focus in this article is with the particular class of use theories that gives *inference* pride of place in their account of meaning. Use theories of meaning of this sort are commonly known as *inferential role semantics* (IRS) or *inferentialism* for short. IRS is a species of *conceptual role semantics*. On a broad understanding of it, conceptual role semantics includes 'any theory that holds that the content of mental states or symbols is determined by any part of their role or use in thought' (Harman and Greenberg 2006, 295). IRS, as we conceive of it, restricts the semantically relevant features of an expression's conceptual role to the regularities or proprieties of inference (or to some particular sub-class of these). The meaning of 'and', for instance, is often said to be determined by the rules of inference governing it. And to understand 'and', i.e. to know what 'and' means, is to infer according to such rules.

In this article, we introduce IRS and some of the challenges it faces. We aim to provide a map of the terrain which offers an overview, but also challenges some of the inferentialist's standard commitments. Our discussion is structured thus. §1 introduces inferentialism and places it into the wider

context of contemporary philosophy of language. §2 focuses on what is standardly considered both the most important test case for and the most natural application of IRS: logical inferentialism, the view that the meanings of the logical expressions are fully determined by the basic rules for their correct use, and that to understand a logical expression is to use it in accordance with the appropriate rules. We discuss some of the (alleged) benefits of logical inferentialism, chiefly with regards to the epistemology of logic, and consider a number of objections. §3 introduces and critically examines Robert Brandom's inferentialism about linguistic and conceptual content in general. Finally, in §4 we consider a number of general objections to IRS and consider possible responses on the inferentialist's behalf.

1 Varieties of inferentialism

Inferentialism is a broad church. In this section, we introduce what we take to be its main varieties, and place them in the wider context of contemporary philosophy of language.

To begin, IRS might be thought to serve as a theory of linguistic meaning. As such, it might be thought of as a theory of the meanings of expressions in a *public* language. Alternatively, it might be taken to be an account of the meanings of expressions in someone's idiolect, or as an account of the contents of symbols in a language of thought, or again it might be thought of as an account of the content of thought.

Some clarification concerning the intended sense of 'thought' is in order. Thoughts, as we will understand them, are the sorts of things that can be grasped or entertained. Thoughts are commonly thought to be composed of concepts displaying something resembling syntactic structure. It follows that thoughts so understood differ from theories that construe propositions as 'unstructured', e.g. theories that identify propositions with sets of possible worlds. Thoughts differ also from Russellian propositions, which are composed of the objects, properties and relations they are about. As Timothy Williamson puts it, 'a thought about Vienna contains the concept of Vienna, not Vienna itself' (Williamson 2006, 2). If Fregean accounts of propositions are correct, then thoughts may be propositions. If they are not, thoughts may

still express propositions. Though we will not take a stand on these issues here, laying out the options and situating our talk of meaning and conceptual content within them should clarify the discussion to follow.

It is a further question how certain aspects of either of the three aforementioned kinds of meaning—meanings of public language expressions, meanings of idiolectal expressions, and meanings of expressions of a language of thought—relate to conceptual content. Some advocates of IRS maintain that mastery of public linguistic meaning is conceptually prior to conceptual content; that one can only have concepts (or at least concepts of any degree of sophistication) once one has grasped the meanings of the corresponding linguistic expressions by knowing how to use them (Dummett 1991, 1993; Sellars 1956). Others hold the weaker view that linguistic meaning is methodologically prior to conceptual content, or at least that thought and talk must go hand-in-hand in that they must be accounted for in unison (Brandom 1994; Davidson 1984, Harman 1999). Thus, on most forms of IRS, the only way to account for conceptual content is by way of an account of linguistic meaning. The thought, usually, is that concepts can only be attributed to creatures capable of manifesting them, and that linguistic competence is required in order to do so. But that is not to say that all inferentialist accounts abide by this language-first methodology. Loar (1981) and Peacocke (1992) both advance views whereupon inferential roles determine mental content, but where linguistic meaning is parasitic on mental content. Linguistic meaning might then be derived from mental contents according to roughly Gricean lines (Grice 1957). With this point being noted, in the following we will allow ourselves to slide from (linguistic) meaning talk to (conceptual) content talk.

We have presented referential semantics and use-theoretic semantics (and IRS in particular) as two '*prima facie* opposing' approaches to meaning and conceptual content. Treating them as opposing alternatives is common practice and indeed partisans on either side often proclaim their opposition to the other side. However, as we have also noted, the difference between IRS and referentialism need not necessarily reveal itself at the level of semantic theory; rather, it is a difference *in the order of explanation*: 'Are (broadly) referential relations explanatorily prior to inferential ones or does the order of explanation run in the opposite direction?' And *this* question is in fact a *metasemantic* question, not a semantic one. The underlying distinction at play

here comes to this. *Semantics* concerns itself with the question of which types of semantic values to assign to different categories of expressions, and how, on the basis of these assignments, the semantic values of complex expressions are functionally determined by the semantic values of their constituent expressions. Metasemantics,[1] in contrast, asks two questions: the *metaphysical* question as to what makes it the case that a given expression has the semantic value it does; and the *epistemological* question as to what a speaker needs to know to count as understanding the expression. Whence our claim that IRS is *not* incompatible with a referential *semantics*. It is incompatible with the metasemantic thesis that referential relations precede inferential ones in the order of explanation.

A proponent of IRS could thus in principle adhere to a referential *semantic* theory—i.e. one that deals in the ordinary semantic concepts of reference, truth and satisfaction and which assigns the customary (typically) extra-linguistic items as semantic values, while at the same time staying true to the spirit of IRS. IRS might then be interpreted as a metasemantic thesis—a thesis about what it is in virtue of which an expression has the semantic value it does (what it is in virtue of which a concept has the content it does) or a thesis about what it takes to understand an expression (grasp a concept), or both. IRS, on this metasemantic interpretation, gives rise to the following two broad theses:

(MD) *Meaning determination*. The meanings of linguistic expressions are determined by their role in inference.

(UND) *Understanding*. To understand a linguistic expression is to know its role in inference.[2]

Thus, a position that takes referential semantics at face-value and appeals to IRS as a source for answers to metasemantic questions is at least conceivable. That being said, given the explanatory priority IRS accords to inferential over referential relations, IRS paves the way for non-standard semantic theories. This may be either because it is thought that IRS constrains semantic theory in such a way as to necessitate the assignment of non-standard semantic values (e.g. assertibility conditions instead of truth conditions or an epistemically constrained notion of truth in the case of anti-realist theories of meaning like those of Michael Dummett, Crispin Wright, etc.); or it may be because it is felt that substantive relations of reference and truth are not warranted or perhaps

not needed once an IRS account of meaning has been offered.[3] Let us call IRS accounts coupled with 'standard' semantic theories *orthodox*, and *unorthodox* otherwise. Moreover, let us call *genuine* those orthodox accounts that take the semantic concepts featured in the semantic theory at face value, and orthodox accounts that are not genuine, *deflationary*.

To bring out some of the characteristic features common to all forms of IRS as well as some of the features by which different of its variants distinguish themselves from one another, it will be helpful to contrast IRS with a theory that *is* straightforwardly incompatible with it. Now, as a species of use-theoretic account, IRS is at odds with any account that takes expressions of a language or concepts to come, as it were, pre-equipped with meanings or contents. Views that run under the banner of informational semantics are a case in point. Roughly, advocates of informational semantics maintain that semantic concepts are to be explained in terms of certain lawlike correlations linking external things or property instantiations to tokenings of corresponding linguistic items or to mental items (Fodor, 1990; Dretske, 2000). The primary mode of semantic explanation thus proceeds by establishing 'direct' language-world mappings. Once the reference and designation relations are established by way of the said reliable correlations between linguistic or mental items and their external causal antecedents, the usual semantic concepts (reference, truth, satisfaction, etc.) are simply explained from the 'bottom up': first, names are associated with their bearers, unary predicates with the properties designated and so on. In a second step, the theory then specifies compositional rules for determining the semantic values of more complex expressions as a function of their semantically relevant component parts. This atomistic mode of explanation is more congenial to certain types of expressions than it is to others. Paradigmatic cases of linguistic expressions that particularly lend themselves to information semantic explanation are observational predicates ('square', 'red') and proper names.

If the prototypical expressions for informational semantical treatment are observational predicates and proper names, the paradigm case for IRS are logical expressions ('and', 'or', 'if', etc.). The semantic values of logical expressions are not readily explained in terms of correlations that may obtain between tokenings of them and external referential relata. Rather, the inferentialist will maintain, the meanings of logical expressions are determined, first

and foremost, by their inferential properties which are encapsulated in the rules governing paradigmatic inferences involving them. Taking the case of logical expressions as its model, IRS takes the bulk of the explanatory work to be done by *intra*-linguistic (or language-language) relations (as opposed to by direct language-world links). Moreover, while information semantics and kindred approaches proceed from the *bottom up* as we have seen, the inferentialist mode of explanation is *top down*: simple declarative sentences are the primary semantic units, for it is the propositions expressed by them that stand in inferential relations. The meanings of subsentential expressions are determined by the contributions these expressions make to the inferential roles the sentences containing them participate in (see Dummett, 1991; Brandom, 1994).

The inferentialist mode of semantic explanation might be thought to apply *locally*, i.e. to restricted regions of language such as logical, moral, causal, deontic, epistemic or theoretical terms; or it might be advanced as a *global* thesis according to which the inferential model of explanation extends to language at large. In order to be able to accommodate expressions that are less straightforwardly explained in inferential terms, global inferentialists will have to include 'language-entry' and 'language-exit' rules (Sellars, 1953) among the relevant 'inferential' connections. That is, uses of expressions like observational predicates will have to be linked to perceptual cues (on the 'entry' side), and they must link up with intentional action (on the 'exit' side). In the absence of any such anchoring of meaning in our experience and interaction with the world, our inferential language game threatens to fail to "latch onto the world", it could not serve as a means for representing the world. We will be examining local versions of IRS in §2, while global accounts of IRS will occupy us in §3.

The comparison of IRS with information semantics is telling also in other respects. For one, it may be noted that information semantics naturally entrains semantic atomism. As Fodor (1990) has stressed, it is possible (at least in principle) on such views that a creature should possess but one concept. Since concept possession depends on being suitably related to the environment, having a concept need not presuppose the possession of others. Things look different when viewed through the prism of IRS, which is incompatible with semantic atomism. The content of a concept is determined by its connections

to other suitably inferentially related concepts. Hence, one cannot so much as have a concept without having many concepts.[4] IRS is thus compatible with, but does not mandate, semantic holism—the position that a statement's meaning (and derivatively the meanings of the sub-sentential expressions figuring within it) is determined by the entire network of inferential connections in which it participates. Whether a particular form of IRS endorses holism and how far-reaching that holism is will depend on which types of inferences are taken to be determinative of meaning. If all inferential links—mediate as well as immediate ones—are to taken into account, IRS will amount to an all-out or 'pandemic' holism: the meaning of one statement is fixed by its place in the network of inferential connections linking it to all other statements expressible in the language. By contrast, some versions of IRS treat only certain more restricted sub-classes of inferences: analytic inferences or inferences that display a particular counterfactual robustness (Sellars, op. cit.). Michael Dummett's 'molecularism' is, as the name makes plain, a further attempt of carving out a middle ground between atomism and holism. The molecularist thus allows for what we might call *semantic clusters*. A semantic cluster is a set of expressions or phrases that are mutually dependent in the sense that the meaning of any member of the set is determined by its inferential links to all the others in the set. Examples are groups of contrary predicates like color words or phrases like 'mother of', 'father of', 'child of'. Famously, according to Quine the expressions 'analytic', 'necessary', 'synonymous' also form a cluster. What the molecularist opposes is the holist notion that all of these clusters collapse into one all-encompassing master cluster, language as a whole.

Typically, strongly holistic versions of IRS are less apt to answer the epistemological question underlying UND: 'What is it that a speaker must know in order to count as understanding an expression?' For, while all-out holism may be a candidate explanation of how it is, metaphysically speaking, that expressions of a language have the meanings they do, it does not deliver a plausible criterion of linguistic understanding. Transferred to an epistemological key, a strongly holistic version of IRS amounts to the thesis that a speaker must somehow grasp the entirety of the inferential network of links obtaining between all the statements expressible in the language. A claim that seems incredible. Not only would no human speaker of any non-trivial

language qualify as understanding any expressions of her language, it also seems deeply unintuitive that my understanding of 'measurable cardinal' (say) should be tied to my appreciation of the correctness of the inference from the proposition that Puck is a cat to the proposition that Puck is an animal. Thus, advocates of IRS *qua* account of linguistic understanding are likely to opt for a non-holistic variant of IRS.[5] The same goes for philosophers who, like Dummett, believe that MD and UND are inseparable, that a theory of meaning is of necessity a theory of what it is a speaker must know in order to understand the expressions of the language. In the following, when we wish to speak of the meaning-determinative or understanding-constituting class of inferential connections in a way that is neutral both with respect to the degree of holistic dependence, we speak of the *salient class* of inferences.

Another important choice point is whether IRS is to be interpreted *descriptively* or *normatively*. On a descriptive reading of IRS, the salient class of inferences is constituted by the inferential connections speakers actually make or are disposed to make or accept under various actual and counterfactual circumstances.[6] On a normative reading, MD and UND are understood in terms of the inferential connections we *ought* to be disposed to make or accept. As Daniel Whiting (2006) emphasizes, the normativity in question involved is not merely consequent upon an expression's having a certain meaning. For instance, that 'cat' means *cat* may have the implication that one ought to apply 'cat' to all and only cats. The case of normative versions of IRS is different. The normativity of the salient class of inferential roles is part and parcel of the meanings they determine: it is because one is in some appropriate sense disposed to recognize the propriety of the inferential connections that one (the community) means what one (it) does by a given expression. Similarly, understanding an expression consists in recognizing the propriety of the relevant set of inferential connections.[7]

This brings us back to another important distinction: the distinction, namely, between individualistic and social (or anti-individualistic) interpretations of IRS. MD, for instance, might be thought of a thesis about the determination of meanings of a particular speaker's idiolect (at a particular time), or it might be interpreted as a thesis about how the meanings of a public language are fixed. The former thesis is compatible with internalistic conceptions of meaning according to which the determinants of meaning

are intrinsic properties of the speaker. Aside from all-out internalism, such views are compatible also with so-called two-factor views. Two-factor views distinguish two aspects of meanings: narrow and broad content. While broad content may be partly determined by the speaker's social or physical environment, narrow content is understood internalistically. Within such a two-factor view, the individualistic reading of an IRS-based thesis about meaning determination might be appealed to as an account of narrow content. In contrast, the anti-individualistic interpretation of IRS is compatible with a social externalism (Burge 1979, 1986; Putnam 1981). It is less clear that such views can accommodate twin-earth-type arguments in favor of physical externalism—the view that the meanings of certain expressions, typically proper names and natural kind terms, are in part individuated by their physical environment. For example, in Putnam's classic thought experiment (Putnam 1975) the meaning-determining inferential roles for 'water' are identical in Oscar's and in Twin Oscar's linguistic communities. All the same, 'water' presumably picks out different substances and hence has different meanings (assuming that meanings determine referents). Some versions of *conceptual* role semantics (incorporated into one-factor views of content) allow for so-called 'long-arm roles', which 'reach out', so to speak, to include the speaker's physical environment and her causal interactions within the speaker's conceptual roles (Harman 1987).Some accept such 'long-arm roles' within IRS. Advocates of IRS who do not—while maintaining that inferential roles determine reference and truth-conditions—will either have to restrict IRS to types of expressions where the physical externalist intuitions have less of a foothold or they will have to dispute those intuitions altogether.

Now, we have said that some proponents of IRS are motivated by MD. But what does it mean to say that inferential roles determine meanings? A fully worked out account of IRS must clarify two things: the relation of determination involved, and the notion of meaning appealed to. Begin with the first of these tasks. On perhaps the most straightforward reading, meanings might simply be identified with inferential roles or rules of inference. Alternatively, meanings might be taken to supervene on inferential roles in the sense that identity of inferential roles guarantees identity of meanings. Or perhaps there are other more sophisticated ways in which inferential roles determine meanings (we will consider one such account in §3).

The second task is not independent of the first. Whether meanings can be identified with inferential roles, for instance, will depend on what meanings are. We consider four uses of 'meaning'. First, 'meaning' may be used to designate the referent or extension of an expression. Second, the meaning of an expression may be equated with the compositional contribution it makes to what is said by a sentence in which it is being used. Third, meanings have sometimes been thought to be the semantic determinants of the referent or extension of an expression. On simple descriptivist accounts, the meaning of a proper name (say) may be a definite description (or cluster of such descriptions). It is in virtue of the description's being satisfied by a particular object, that the associated name names its bearer. Fourth, and finally, 'meaning' is often used to designate what it is that a speaker must grasp in order to understand it.

Here is not the place for a comprehensive survey of all of the combinatorial possibilities. Nevertheless a handful of examples will give the reader an impression of the clarificatory work necessary to fully spell out a version of inferentialism. For instance, inferential roles cannot be identified with meaning in the first sense of 'meaning', since what we talk about when we talk about Saul Kripke or aardvarks are people and perhaps kinds, properties or classes of objects, not inferential roles. Similarly, if meaning is understood as the semantic contribution to what is said by a sentence, then if what is said by sentence is a Russellian proposition or a proposition conceived of as a set of possible worlds, inferential roles, again, cannot be identified with meanings. It is at least conceivable, by contrast, that inferential roles are (or otherwise determine) that which determines reference, or that they are what a speaker needs to master in order to understand an expression having those inferential roles. Completing the survey would require a similar analysis of other forms of meaning determination.

Enough, then, about IRS's place in the landscape of contemporary approaches in the philosophy of language. The next two sections focus on, respectively, the arguably most important local version of IRS, *logical* inferentialism, and Brandom's global inferentialism.

2 Logical inferentialism

Though various local brands of IRS have been advanced, logical inferentialism, IRS as it applies to logical vocabulary deserves special attention. Inferentialist accounts of logical expressions, we noted, seem especially natural. As a result, such accounts are often regarded as a model for IRS in general. As Brandom puts it, typically inferentialists 'look to the contents of logical concepts as providing the key to understanding conceptual content generally' (Brandom 2007, 161). We begin by introducing some of logical inferentialism's standard motivations and commitments (§§2.1-2). We then discuss a response inspired by Gerhard Gentzen's work to Arthur Prior's famous attempt to undermine the view, and consider a potential corollary of Gentzen's response, viz. that logical inferentialism validates a non-classical logic (§§2.3-4).

2.1 The only game in town?

Inferentialists frequently distinguish two central aspects of the correct use of a sentence: the conditions under which it may correctly asserted, and the consequences that may be correctly derived from (an assertion of) it. As Dummett puts it:

> crudely expressed, there are always two aspects of the use of a given form of sentence: the conditions under which an utterance of that sentence is appropriate, which include, in the case of an assertoric sentence, what counts as an acceptable ground for asserting it; and the consequences of an utterance of it, which comprise both what the speaker commits himself to by the utterance and the appropriate response on the part of the hearer, including, in the case of assertion, what he is entitled to infer from it if he accepts it. (Dummett 1973, 396)

On their most common interpretation, introduction rules in a natural deduction system (henceforth, I-rules) state the sufficient , and perhaps necessary, conditions for introducing complex sentences; elimination rules (henceforth, E-rules) tell us what can be legitimately deduced from any such sentence. Logical inferentialism, then, becomes the claim that the meanings of logical expressions are fully determined by their I- and E-rules (corresponding to MD

above), and that to understand such expressions is to use them according to such rules (corresponding to UND).[8]

The idea that rules can fix meanings became increasingly popular in the 30's and 40's. For logical expressions, the strategy is an especially tempting one. For one thing, one can *prove* that, if $\wedge$ satisfies its I- and E-rules

$$\wedge\text{-}I\ \frac{A \quad B}{A \wedge B} \qquad \wedge\text{-}E\ \frac{A \wedge B}{A}\ \frac{A \wedge B}{B}\ .$$

and if the rules are truth-preserving, then sentences of the form $\ulcorner A \wedge B \urcorner$ must have their standard truth-conditions:

($\wedge$) $\ulcorner A \wedge B \urcorner$ is true iff $\ulcorner A \urcorner$ is true and $\ulcorner B \urcorner$ is true.[9]

For another, a speaker who did not master $\wedge$-I and $\wedge$-E can hardly be credited with an understanding of conjunction. And, conversely, it would seem to be a mistake not to attribute an understanding of conjunction to a speaker who *did* master $\wedge$-I and $\wedge$-E. Indeed, what else could account for one's understanding of logical expressions? As Paul Boghossian puts it:

> It's hard to see what else could constitute meaning conjunction by 'and' except being prepared to use it according to some rules and not others (most plausibly, the standard introduction and elimination rules for 'and'). Accounts that might be thought to have a chance of success with other words—information-theoretic accounts, for example, or explicit definitions, or teleological accounts—don't seem to have any purchase in the case of the logical constants. (Boghossian 2011, 493)

Accordingly, the view that for logical expressions inferentialism is the only game in town, is widely shared.

Boghossian offers a second argument in favour of logical inferentialism, viz., that it makes for an elegant account of blind but blameless reasoning—one that seeks to explain how justification (or knowledge) can be transmitted from premises to the conclusion in deductive inference. In a nutshell, any such account is constrained by the failures of simple inferential internalism (SII) and simple inferential externalism (SIE). According to SII, it is required not only that (i) I be justified in believing the premises of a deductive inference and (ii) that the conclusion be justified independently of the premises, but

also (iii) that I can know by reflection alone that the premises provide me with good grounds for believing the conclusion. SII amounts to a form of access internalism about deductive inferential justification. Aside from (i) and (ii), SIE requires (iv) that the pattern of inference exemplified be valid (necessarily truth-preserving). Boghossian's proposal is to suggest instead that our inferences are *blind*, because we cannot be expected to satisfy (iii), on pain of starting an infinite regress or else invoking dubious faculties of rational insight. But it is also not enough that our inferences satisfy (iv) since inferences may be reckless and hence blameworthy despite being truth-preserving. So, justification transferral must admit of blind and blameless inferences:

> a deductive pattern of inference P may be blamelessly employed, without any reflective appreciation of its epistemic status, just in case inferring according to P is a precondition for having one of the concepts ingredient in it. (Boghossian 2003, 239)

The fact that I take A thoughts to be a warrant for believing B thoughts is constitutive of my having these thoughts (A or B) at all. But, then, how can I be epistemically blameworthy for making such an inference? We return to this admittedly controversial argument in §4 below.

The resulting view, then, is an analytic approach to logic—one according to which logical truths are *epistemically analytic* (Boghossian 1996, 2003): if A expresses a logical truth, then the proposition it expresses can be known on the basis of a grasp of the meaning of the sentence alone. Whether logical inferentialism is also committed to a *metaphysical* conception of analyticity—one according to which logical truths owe their truth solely to the meanings of the logical expressions (and to the facts)—is more controversial (see e.g. Russell 2014, Warren 2015).

2.2 Harmony

Logical inferentialism is a form of *conventionalism*: certain logical laws, the thought goes, are stipulated to hold or else somehow extracted from our practice. Thus, Dummett writes:

> Although it is not true of logical laws generally that we are entitled simply to stipulate that they shall be treated as valid, there must

> be certain laws or systems of laws of which this holds good. Such laws will be 'self-justifying': we are entitled simply to stipulate that they shall be regarded as holding, because by so doing we fix, wholly or partly, the meanings of the logical constants that they govern. (Dummett 1991, 246)

The thought seems to be this: while in the overwhelming majority of cases the question whether we may accept a certain logical law is already settled (it depends on whether the given law can be derived from laws that are already accepted), *basic* laws cannot be justified in this way, on pain of an infinite regress. The question arises, however, whether *any* seemingly basic law can be regarded as determinative of meaning.

An affirmative answer yields disaster, as Arthur Prior's infamous binary connective `tonk` shows (see Prior 1960):

$$\texttt{tonk-I}\ \frac{A}{A\ \texttt{tonk}\ B} \qquad \texttt{tonk-E}\ \frac{A\ \texttt{tonk}\ B}{B}\,.$$

If the consequence relation is transitive, and at least one theorem can be proved in one's system, then *any* sentence can be proved in one's system. To the best of our knowledge, the first sketch of an inferentialist solution to the problem was given by Gerhard Gentzen in 1934. In a famous passage, Gentzen writes:

> To every logical symbol &, $\vee$, $\forall$, $\exists$, $\rightarrow$, $\neg$, belongs precisely one inference figure which 'introduces' the symbol—as the terminal symbol of a formula—and which 'eliminates' it. The fact that the inference figures &-E and $\vee$-I each have two forms constitutes a trivial, purely external deviation and is of no interest. The introductions represent, as it were, the 'definitions' of the symbols concerned, and the eliminations are no more, in the final analysis, than the consequences of these definitions. This fact may be expressed as follows: in eliminating a symbol, we may use the formula with whose terminal symbol we are dealing only 'in the sense afforded it by the introduction of that symbol'. (Gentzen 1934, 80)

Gentzen argues that the I-rules of his newly invented calculus of natural deduction 'fix', or 'define', the meanings of the expressions they introduce.

He also observes that, on this assumption, E-rules cannot be chosen randomly. They must be justified by the corresponding I-rules: they are, in some sense, their 'consequences'. This key thought expresses *in nuce* the idea that I- and E-rules must be, in Dummett's phrase, in *harmony* with each other. Conversely, if it is thought that E-rules are meaning-constitutive, I-rules cannot be chosen arbitrarily either (see e.g. Dummett 1991, 215).

This intuitive idea can be spelled out in a number of ways. Dummett (1991, 250) and Prawitz (1974, 76) define harmony as the possibility of eliminating *maximum formulae* or *local peaks*, i.e. formulae that occur both as the conclusion of an I-rule and as the major premise of the corresponding E-rule (see also Prawitz 1965, 34). The following reduction procedure for $\rightarrow$, for instance, shows that any proof of B via $\rightarrow$-I and $\rightarrow$-E can be converted into a proof from the same or fewer assumptions that avoids the unnecessary detour through (the introduction and elimination of) $A \rightarrow B$:

$$\dfrac{\dfrac{\begin{array}{c}\Gamma_0,\,[A]^i\\ \Pi_0\\ B\end{array}}{A \rightarrow B}\,{\scriptstyle \rightarrow\text{-I},\,i} \qquad \begin{array}{c}\Gamma_1\\ \Pi_1\end{array}}{B}\,{\scriptstyle \rightarrow\text{-E}} \quad \rightsquigarrow_r \quad \begin{array}{c}\Gamma_1\\ \Pi_1\\ \underbrace{\Gamma_0,\,A}\\ \Pi_0\\ B\end{array}$$

where $\rightsquigarrow_r$ reads 'reduces to'. Dummett (1991, 250) calls the availability of such procedures *intrinsic* harmony where, crucially, the reduction reduces the *degree of complexity* of a derivation, i.e. the number of occurrences of logical operators. He correctly points out, though, that it only prevents elimination rules from being stronger than the corresponding introductions, as in the case of Prior's `tonk`. It does not rule out the possibility that they be, so to speak, too weak (see Dummett 1991, 287).[10] A way to ensure that E-rules be strong enough is to require that they allow us to *reintroduce* complex sentences, as shown by the following *expansion*:

$$\begin{array}{c}\Pi\\ A \wedge B\end{array} \quad \rightsquigarrow_e \quad \dfrac{\dfrac{\Pi}{A \wedge B}\,{\scriptstyle \wedge\text{-E}} \qquad \dfrac{\Pi}{A \wedge B}\,{\scriptstyle \wedge\text{-E}}}{A \wedge B}\,{\scriptstyle \wedge\text{-I}}$$

where $\rightsquigarrow_e$ reads 'can be expanded into'. This shows that any derivation Π of $A \wedge B$ can be expanded into a longer derivation which makes full use of both $\wedge$-I and $\wedge$-E. Accordingly, a pair of I- and E-rules for a constant \$ can be taken

to be harmonious iff there exists both reduction and expansion procedures for \$-I and \$-E. Alternative conceptions of harmony are developed in e.g. Read (2000) and Tennant (1997, 2008). For an overview see Steinberger (2011a). But *why* exactly should I- and E-rules for logical expressions be harmonious?

One motivating thought behind the requirement of harmony is that logic is *innocent*: it shouldn't allow us to prove atomic sentences that we couldn't otherwise prove (Steinberger 2009). Yet another motivating thought has it that I-rules determine, in principle, necessary and sufficient conditions for introducing complex sentences. The necessity part of this claim is in effect what Dummett calls the Fundamental Assumption, that '[i]f a statement whose principal operator is one of the logical constants in question can be established at all, it can be established by an argument ending with one of the stipulated I-rules' (Dummett 1991, 252). The Assumption lies at the heart of the proof-theoretic accounts of validity (Prawitz 1985, Dummett 1991). To see that it justifies a requirement of harmony, let $\mathcal{CG}[A]$ be the canonical grounds for a complex statement A, as specified by its I-rules. Then, we may reason that, by the Fundamental Assumption, B follows from $\mathcal{CG}[A]$ if and only if B follows from A itself.[11] In short: it is a consequence of the Fundamental Assumption that complex statements and their grounds, as specified by their I-rules, must have the same set of consequences. That is, I- and E-rules must be in harmony with each other in the following sense: one may infer from a complex statement nothing more, and nothing less, than that which follows from its I-rules.

If harmony is a necessary condition for logicality, then Prior's `tonk` need not worry the logical inferentialist: the `tonk` rules are spectacularly disharmonious, and hence cannot define a *logical* connective.[12] The rules are also *non-conservative*: they allow one to prove sentences in the `tonk`-free language that were not previously provable in the absence of the rule for `tonk` (indeed they allow us to prove any such sentence). And indeed, the first response to Prior's `tonk`, published by Nuel Belnap in 1962, was precisely that admissible rules should yield conservative extensions of the base systems to which they may be added.[13]

The conservativeness requirement is equivalent to the requirement that an admissible logical system S be *separable*, i.e. such that every provable sentence or rule in the system has a proof that only involves either structural

rules or rules for the logical operators that figure in that sentence or rule. In conjunction with UND, separability makes for an *atomistic* account of one's understanding of the logical vocabulary—one according to which to understand \$ is to know how to use it correctly, the totality of uses of \$ (i.e. the derivations of rules and theorems involving sentences with \$ as their main logical operator) is derivable from the basic rules for \$, and, consequently, one's grasp of \$'s rules is sufficient for knowing \$'s meaning. Thus, on the foregoing view, a speaker could understand $\wedge$ without understanding $\exists$, $\rightarrow$ without understanding $\neg$, and so forth. Insofar as our understanding of the logical vocabulary *could* be atomistic, it might be argued that an adequate axiomatisation of logic ought to be separable, on pain of ruling out a possible way our understanding actually is.

2.3 Inferentialism and logical revision

Proof-theoretic constraints such as harmony, conservativeness, and separability rule out Prior's `tonk`. However, it may be argued that they rule out much more. For while the rules of intuitionistic logic are harmonious, standard formalizations of classical logic typically aren't (Dummett 1991, Prawitz 1977, Tennant 1997). For instance, the classical rule of double negation elimination

$$\textsf{DN}\ \frac{\neg\neg A}{A}$$

is not in harmony with the standard rule of negation introduction:

$$\neg\text{-I},\, i\ \frac{\begin{array}{c}[A]^i\\ \vdots\\ \bot\end{array}}{\neg A}\,.$$

The harmonious rule of negation elimination is the following *intuitionistic* rule:

$$\neg\text{-E}\ \frac{A \qquad \neg A}{\bot}\,.$$

This rule, unlike its classical counterpart, allows us to infer from $\neg A$ precisely what was required to assert $\neg A$: a derivation of $\bot$ from A. But, then, double negation elimination is left, so to speak, in the cold. Similarly, standard

axiomatisations of classical logic are not separable. For instance, some uses of $\rightarrow$ such as Peirce's Law, that $((A \rightarrow B) \rightarrow A) \rightarrow A$, are only derivable by means of rules for *both* $\rightarrow$ and $\neg$. Intuitionists such as Dummett, Prawitz and Tennant have taken this observation to show that classical rules such as double negation elimination are not logical (or that they are in some other sense defective), and that the logical rules we should adopt are those of *intuitionistic logic*, i.e. classical logic without the Law of Excluded Middle ($A \vee \neg A$), double negation elimination and other equivalent rules (or perhaps of a weaker logic still (Tennant 1987, 1997)).

This argument is problematic, however. For while it is true that *standard* axiomatisations of classical logic are not harmonious, a number of non-standard axiomatisations are both harmonious and separable. In particular, classical logic can be shown to be as proof-theoretically as respectable as intuitionistic logic provided rules are given both for asserting and for *denying* complex statements (Rumfitt2000, Incurvati and Smith 2009), where denial is taken to be a primitive speech act distinct from the assertion of a negated sentence (Parsons 1984, Smiley 1996). The negation rules for classical negation are then as harmonious as the intuitionistic ones: they allow one to deny $\neg A$ given the assertion of A and *vice versa*, and to deny A given the assertion of $\neg A$ and *vice versa*.[14]

Local forms of inferentialism, beyond logical inferentialism, have recently been developed by a number of authors. For instance, Matthew Chrisman (2010, 2015) and Ralph Wedgwood (2007) develop an inferentialist account of deontic modals, Julian Reiss (2012) offers an inferentialist account of causal claims, Mauricio Suarez (2004) defends an inferential conception of scientific representation. In the next section, we consider perhaps the most prominent attempt at elaborating a global inferentialism for language at large.

3 Brandom's inferentialism

Perhaps the most worked out version of global inferentialism has been put forward by Robert Brandom (1994, 2000, 2008).[15] In this section, we summarize Brandom's account and situate it with respect to the choice points within inferentialism identified in §2. Given the expanse of Brandom's writings and

the critical literature it gave rise to, our discussion will inevitably have to omit many noteworthy aspects of Brandom's work and of the responses to it.

Brandom's account, like any inferentialist account, is use-theoretic or, in his preferred vocabulary, pragmatic. Semantics, in Brandom's slogan, is 'answerable to pragmatics' (Brandom 1994, 83). His account's point of departure is the *doings* of linguistically endowed creatures, in particular their practices of asserting and inferring which, according to him, 'come as a package' (Weiss and Wanderer, 313). It is through the speech act of assertion that we advance claims which, in turn, are expressed by declarative sentences. And it is the contents of these assertions (expressed by declarative sentences) that are susceptible of standing in inferential relations. It is for this reason that declarative sentences are taken to be the primary unit of significance and so enjoy a privileged semantic standing (Brandom 1994, 79).

Aside from being a use theory of meaning, Brandom's theory may further thus be classified as an assertibility theory of meaning: the meanings of declarative sentences are to be explained in terms of the conditions under which an assertion is appropriate or correct. However, Brandom's approach differs in a number of significant ways from other types of assertibility theories.

Brandom follows Dummett's lead in seeking to extend to the whole of language Gentzen's bipartite model of the meanings of logical expressions in terms of I-rules and E-rules (see the previous section). On the proposed picture, the meaning of a sentence (or of a thought) can be characterized in terms of the two aspects of its assertoric use: the 'set of sufficient conditions' that would warrant its assertion and the 'set of necessary consequences' (Brandom 2000, 63) of doing so' (as well as, we will see, the set of claims incompatible with it).

Crucially, the inputs for and the outputs of assertions are construed inferentially. That is, the meaning of a sentence is to be explained via its inferential antecedents and consequences. The meanings of subsentential expressions, though unfit in and of themselves to act as relata of inferential connections, are then to be accounted for in terms of the systematic contributions they make to the assertibility conditions of the sentences of which they are constituents. Their semantic contributions are accounted for in terms of their substitutional behavior Brandom (1994, ch. 6). Where Brandom departs from Dummett is in the deflationary nature of his account. Traditional semantic notions of

reference and truth are explained in broadly deflationist terms, as having an 'expressive' role—they enable us to render explicit certain intentional and anaphoric features of our practice which otherwise remain implicit within them Brandom (1994, ch. 5).[16]

As we noted in §2, certain expressions appear to lend themselves more readily to inferentialist treatment than others. However, since Brandom's account lays claim to global applicability, it must be capable also to account for observational predicates like 'red', for instance. According to Brandom, even the possession of a color concept like *red* requires more than merely an ability to respond differentially to red things. Parrots, barometers and thermometers all respond differentially to certain stimuli, yet they cannot be credited with the corresponding concepts. Full conceptual competence presupposes an appreciation of the inferential connections from and to thoughts containing the concept in question, e.g. the inference from 'this is crimson' to 'this is red', or from 'this is red' to 'this is colored'.

What confers meaning to a sentence is that it may be correctly inferred from certain sentences, and that other sentences may be inferred from it. This presupposes an appreciation on the part of the speaker that the sentence may act as a premise and as a conclusion in arguments.[17] In Brandom's oft-cited Sellarsian slogan, the meaning-determinative linguistic and conceptual practices of asserting and inferring are to be conceived of as taking place within the 'game of giving and asking for reasons'. His aim is to explain how our practices of asserting, challenging, defending and retracting assertions by exploiting the inferential connections within which the asserted contents stand, are able to confer meanings to the linguistic vehicles by which these linguistic acts are performed.

Crucially, the meaning-constitutive inferential patterns are not *formal* inferences (i.e. deductive relations that are truth-preserving in virtue of the logical forms of the claims), but rather *material* ones including analytic inferences like 'Philadelphia is south of New York City; therefore, New York City is north of Philadelphia' as well as defeasible a posteriori ones like 'this substance burns in a white flame; so, this substance is magnesium'. It is these material inferential relations (not formal ones) that we rely upon in justifying, challenging and defending our assertions, and it is therefore they which constitute inferential roles of sentences.[18] The supposed primacy of formal inference is taken to be

an artifact of the referentialist order of explanation: subsentential expressions are thought to have semantic values in virtue of the referential relations they stand in. These semantic values compositionally determine the truth-values of sentences. And these, together with the logical forms of the sentences, go on to determine the formal logical consequences of those sentences. On Brandom's account, by contrast, it is material inference that takes center stage. Indeed, logical concepts are inessential to (non-logical) conceptual practices. The role of logical vocabulary, as that of semantic vocabulary, is *expressive*, according to Brandom. It is in virtue of such expressive vocabulary that we are able to subject our concepts to critical scrutiny, laying bare the commitments we incur by virtue of operating with those concepts. However, it is not directly determinative of meaning.[19]

An important feature of Brandom's inferentialism, we said, was its bipartite structure of its analysis of assertibility conditions, which it inherits from Dummett. Like Dummett, Brandom rejects assertibility theories that focus on the grounds of assertion to the exclusion of the consequences of assertion. Such one-sided accounts, he claims, are unable to discriminate the meanings of 'I will write a book about Hegel' and 'I foresee that I will write a book about Hegel'. For while the circumstances warranting the assertion of either sentence are the same, the consequences of doing so differ Brandom (2000, 65). One-sided accounts, according to him, are unable to account for that difference.

Also, much like Dummett, Brandom's inferentialism is a broadly social and normative inferentialism. The relevant meaning-determining inferential roles are the ones that govern not the expressions of a particular idiolect but those of a public language. What is more, inferential roles, for Brandom, are not to be construed merely as *regularities* within a social inferential practice, but rather as *proprieties* and so normatively. Where Brandom's assertibility theory goes beyond Dummett's is in that he aims to offer an analysis of the 'normative fine structure' of the grounds and the consequences of asserting in terms of the normative categories of *commitment* and of *entitlement*.

Start with commitment. Asserting is a way of expressing one's endorsement of a proposition. But for such an endorsement to have the distinctive force of an assertion, it must be subject to the norm that assertions entail commitments to the material implications of the asserted contents. A speech

act not accompanied by such a commitment would not qualify as an assertion. For instance, in asserting that this is red, I commit myself to the claim that this is colored. Commitment thus has the deontic force of obligation: having asserted that this is red, I ought also to endorse what follows from the content of my assertion, e.g. that this is colored.

The second category of entitlement must be understood against the backdrop of Brandom's rationalism about language. The practice of asserting, for him, is essentially bound up with our practice of exchanging reasons. Upon advancing a claim by asserting it, I may appropriately be challenged by you. I meet your challenge by demonstrating my entitlement to the claim, for instance by pointing to a further claim to which I am already entitled and from which the claim I advance may be correctly inferred. For example, I can demonstrate my entitlement to the claim that this is red provided that I am entitled to the claim that this is scarlet. The reason my entitlement carries over from an assertion of the latter sentence to an assertion of the former, is because the sentences express contents that stand in an entitlement preserving inferential relation. While commitments corresponded to the 'deontic status' of obligations, we can now see that entitlements correspond to permissions.

The deontic modalities (like other modalities) of obligation and permission are customarily taken to be duals of one another as witnessed by their interdefinability with the help of formal negation (e.g. it is obligatory that p just in case not-p is not permissible and vice versa). Given his conception of logical vocabulary as having an expressive and hence auxiliary role, Brandom does not wish to appeal to the formal concept of negation at this explanatorily fundamental level. Nevertheless, commitments and entitlements interact in important ways. In particular, Brandom defines a notion of incompatibility or material negation in terms of them: two propositions are incompatible with one another just in case commitment to one precludes entitlement to the other.

Aside from being able to give a more refined account of the central notion of inferential role, Brandom claims that the three additions to his conceptual tool belt—commitment, entitlement and incompatibility—enable him to deal with a problem that has long bedeviled assertibility theories of meaning. To see what the trouble is note that assertions can be said to be correct in two ways. An assertion can be said to be correct *by the lights* of the agent or of the agent's linguistic community if it is warranted by the relevant standards

(e.g. 'Was the evidence properly taken into account?' 'Were the inferences made sound ones?' and so on). But of course even the individual may be subjectively correct in this sense by their lights and hence blameless, they may still be wrong. So there is a second, objective sense in which an assertion's correctness may be appraised. In this sense an assertion is correct just in case it is true, i.e. just in case it tells it how it is. Traditionally, Brandom claims, assertibility theories have struggled to account for objective correctness in this sense.

Oftentimes the assertibility theorists resorted to certain types of idealizations in order to narrow the gap between the two types of normative appraisals by defining objective correctness as subjective correctness under certain ideal conditions (perfect evidence, at the end of inquiry, etc.). Brandom believes that idealizing manoeuvres of this kind are doomed to failure. For a typical problem case consider Brandom's example:

1. The swatch is red.

2. The claim that the swatch is red is now assertible by me.

Although the second sentence merely seems to make explicit, what according to the assertibility theorist is implicit in the act of asserting the first sentence, the two sentences intuitively differ in content. The two sentences, though assertible in the same circumstances, differ in their truth conditions. However, Brandom believes that his account delivers the means necessary to capture the difference in semantic content without abandoning the assertibilist . For the two sentences to have the same content, they would have to rule out the same claims; they would have to be, in Brandom's vocabulary, 'incompatibility-equivalent' Brandom (2000, 199). But this is not the case. For instance, 1. is compatible with it being the case that rational beings have never evolved, whereas 2. is not.[20]

Needless to say, Brandom's grand project has faced a great number of criticisms.[21] Here we will single out merely one central strand of criticisms because of its relevance to other inferentialist enterprises: Brandom's holism.[22] In §2, we noted that if inferentialism is to play the part of a metasemantic account—a theory of MD, of UND or both—it must explain which types of inferences have the relevant metasemantic relevance; i.e. which inferences are meaning-determinative or which ones are understanding-constitutive.

Brandom, we had said, endorses the controversial thesis that *all* inferential connections to which the sentence contributes are relevant. We have already noted some of the intuitive difficulties faced by Brandom's view *qua* theory of understanding. In the following passage Brandom himself stresses in particular the difficulty of accounting, on a holistic account, for the 'possibility of communication or of interpersonal understanding':

> If the inferential significance of a claim depends on what else one is committed to, then any difference between the collateral commitments of speaker and audience can mean that a remark has a different significance in the one's mouth than it does in the other's ear. How is it then possible to make sense of the idea that they understand one another, so as to be able to agree or disagree? If the contents expressed by sentences must be individuated as finely as the theories they are embedded in, the intelligibility of communication across theories—the very notion of conveying information—is threatened. [...] If, because of his very different collateral commitments, Rutherford meant something quite different by 'electron' than I do, it seems I can't disagree with him about whether electrons have fixed positions and orbits, since I can't either say or think anything with the content he would have expressed by saying "electrons orbit the nucleus." How, then, are we to understand so much as the possibility of cognitive progress in science? (Brandom 2007, 168)

How, in the light of this is a holistic account of understanding and communication to get off the ground? A natural answer, it might be thought, is to maintain that Rutherford's and Brandom's use of 'electron' overlap sufficiently to ensure communication; that their uses of the term are sufficiently similar. However, Fodor and Lepore (2001) and others have argued that such appeals to similarity will not do. The reason, according to them, is that any appeal to similarity in use would appeal to related expressions. For instance, it is of no help to point to the fact that both Brandom and Rutherford may agree that electrons are negatively charged, because their different theoretical commitments lead them to assign different meanings to 'charge' (see Fodor and Lepore 2001). However, Brandom takes this conclusion to be too hasty.

While it may be that many of the inferential roles the two associate with the expression differ in myriad ways, many of the non-inferential circumstances under which both would apply the term are the same, or at least sufficiently similar:

> Thus Rutherford and I are both disposed to respond to a bolt of lightning by applying the term 'electron', and to respond to applying the expression 'high voltage, high amperage electron flow' to a bare piece of metal by avoiding contact with it. These language entry and language exit moves, no less than the language-language ones, also give us something important in common, even when described at a so-far-subsemantic level, that is, in a nonsemantic vocabulary. I do not see why the structures so-described do not underwrite a perfectly intelligible notion of partially shared, or merely similar inferential roles Brandom (2007, 171).[23]

Moreover, Brandom dismisses the notion that understanding should be understood on the 'Lockean' model according to which my understanding you consists in your idea being transferred or reproduced in my mind. Instead, we should understand 'understanding' in accordance with Brandom's picture of the normative practices that are constitutive of meanings in the first place. One's advancing a sentence assertorically should be understood against the background of social 'scorekeeping' practices in which my interlocutors track my and others' commitments and entitlements as a result of my assertion (see Brandom 1994, 180ff). These scorekeeping practices represent Brandom's account of how it is that content-conferring norms are socially instituted. They are thus to be understood as an attempt at a reductive (though non-naturalistic) account of content. Contents (and intentionality with them) are to be understood in terms of the normative practices by which we monitor and assess our rational discourses of asserting, challenging, justifying and retracting. 'The capacity to understand each other', on this picture, 'is the practical ability to navigate across the gulf between doxastic perspectives created by the effect of differing collateral commitments on the inferential significance of one noise in the mouth that utters it and the ear that hears it' (Brandom 1994, 667). The trouble with this reductive view, however, is that it seems hard to see how explanatorily basic normative practices can be

described without already making use of intentional vocabulary (Fodor and Lepore 2010, Rosen 1997).

Rather, than further dwelling on objections specifically leveled at Brandom, we now turn to a number of more general objections to inferentialism.

4 Objections and replies

Objections to IRS are legion.[24] For reasons of space, we focus on two main lines of criticism: a general worry about IRS *qua* unorthodox semantics, and Timothy Williamson's recent sustained attack to UND, understood as the claim that to understand an expression is to be disposed to make and accept basic inferences featuring it. We begin with the former.

The thought that the content of a sentence in context is given by, perhaps among other things, its truth-conditions—truth-conditional semantics, for short—lies at the heart of much of contemporary linguistic semantics and philosophy of language. As Williamson observes, 'this simple idea has been basic to the massive development of mainstream formal semantics over recent decades, in both linguistics and philosophy of language, for natural and artificial languages' Williamson (2010).[25] However, Williamson argues, this simple and fruitful idea is incompatible with IRS. He writes:

> If you want an explicit theory of how some particular linguistic construction contributes to the meanings of sentences in which it occurs, the inferentialist is unlikely to have one. Better try the referentialist Williamson (2010).[26]

The thought seems to be this. Given the empirical success of contemporary truth-conditional semantics, it would be a mistake to abandon it on philosophical grounds, in favour of an untested, and mostly under-developed, alternative inferentialist semantic theory, which, at least in its present state, seems too crude to rigorously account even for fairly common place semantic of the semantic phenomena. However, our discussion in §1 shows that this objection may be off target.

The objection conflates the levels of semantics and metasemantics. The proponent of IRS can in principle be impressed with the advances of referential semantic theories and indeed endorse them, while maintaining that

meta-semantic questions—MD and UND—call, in whole or in part, for an inferentialist treatment. In §2, we called inferentialists of this type orthodox. The inferentialist at the level of metasemantics then faces the further question as to how the referentialist's semantic values are to interpreted: Are they to be taken at face-value metaphysically or not? That is, in our terminology, is the inferentialist a *genuine* (orthodox) inferentialist or a *deflationary* one? As for MD, several authors (see e.g. Peacocke 1992, Hodes 2004, MacFarlane 2005) have maintained that an inferentialist account of MD as applied to logical expressions is compatible with truth-conditional semantics for them—indeed, in suitable presentations of classical logic, inference rules *fix* the semantic interpretation of the logical vocabulary (e.g. Smiley 1996, Rumfitt 2000). The same is true for other expressions, such as deontic modals (see e.g. Wedgwood 2007, Chrisman 2010) and indeed perhaps for the whole of language. Among these authors, some might advocate genuine variants (e.g. Wedgwood (2007)) others deflationary variants of deflationism (e.g. Brandom 1994, 2000).

Williamson, however, remains skeptical. He writes:

> Since inferential relations do not fix truth and reference, meaning has not been adequately tied to the language-independent world (Williamson 2010).

But Williamson simply *presupposes* the falsity of metasemantic interpretations of MD. Pending an argument for this presupposition, it seems fair to conclude that the general worry against inferentialism has little to go on.

Let us turn, then, to the second general line of criticism. In a number of publications, Williamson has launched a sustained attack afflicting, according to him, various 'programs which go under titles such as "conceptual role semantics", "inferentialism" and "use theories of meaning"' (Williamson 2006, 6, n. 5). Once again it is important to situate Williamson's objections within the map of inferentialist positions laid out in §2. The target of Williamson's criticism is the inferentialist's claim to be able to account for UND; it in no way concerns MD. What is more, Williamson's criticisms presuppose that understanding a sentence, for the inferentialist, is constituted by a grasp of certain epistemically analytic inferential relations. For instance, as we have seen, it may be a necessary condition in order to count as understanding 'and' that one appropriately recognizes the correctness of the inferential relation

from $\ulcorner A$ and $B\urcorner$ to A and to B. The assumption, here, is that there must be some salient subset of the inferential relations an expression enters into that is constitutive of understanding it. Hence, on Williamson's picture, the inferentialist is committed to a version of epistemic analyticity in the sense of Boghossian (1996, 1997, 2003). It is a consequence of this that, necessarily, someone who understands a given sentence, appropriately accepts certain inferences from and to that sentence. Williamson's objection to inferentialist theories of understanding do not, therefore, tell against theories of this type that do not rely on epistemic analyticity in this way. It is at least worth noting that not all inferentialist accounts of understanding are committed to epistemic analyticity in this way; our discussion of Brandom's holism in the previous section is a case in point.

What, then, does Williamson's objection amount to? For simplicity, we summarize the objection as it is directed against any form of analyticity-based account of understanding; inferentialism amounts to a special case. His take-home message is this: understanding is an elastic notion—it cannot be adequately captured by any account that ties understanding to necessary conditions on the assent-dissent patterns of individual speakers or their acceptance of certain inferential relations. Consider the sentence

(Vixen) Every vixen is a female fox.

According to UND, necessarily, whoever understands Vixen assents to it. It is constitutive of one's understanding of 'vixen' that under suitable conditions (e.g. provided one understands the remaining words occurring in the sentence), one assents to Vixen. Call a theory of understanding of this general form a *criterial* theory of understanding. Williamson provides a recipe for generating counterexamples to any such theory.

Suppose e is an expression, m its meaning. According to a criterial account of understanding, there must be a sentence or pattern of inference $C(e)$ such that a speaker's assent to it or appropriate recognition of it is necessary for her to count as understanding e. Williamson claims to have a general recipe for cooking up counterexamples to any such $C(e)$, for any e. Namely, we can imagine an expert on m who, on (possibly erroneous) theoretical grounds, rejects $C(e)$. By the criterialist's standards our expert does not understand e. But surely, by any ordinary standards, she *does* understand e—she is an

expert, after all.

In order to get a better feel for the foregoing schematic objection, let us consider one of its instances. Suppose, as seems *prima facie* reasonable from the inferentialist's point of view, that an appropriate appreciation of *modus ponens* (MP) is constitutive of understanding 'if'. As for any case, Williamson believes a counterexample can be concocted also for this case. That is, a counterexample in which an expert whose semantic competence cannot reasonably be questioned rejects the criterial pattern of inference or sentence. Indeed, no concocting is even needed in this case, Williamson thinks: in Vann McGee we already have a ready-made, real-life example of someone who is undeniably an expert about conditionals but nevertheless denies the validity of MP. His denial is founded on a number well-known putative counterexamples involving nested conditionals (see e.g. McGee 1985, 462).

For present purposes, it does not matter if McGee is right—we may even suppose that his example is fallacious, and that 'if' in English satisfies MP after all.[27] What matters is that, his erroneous views about MP notwithstanding, McGee surely understands 'if'. All the same, according to UND it seems we must say that he does not. So UND must be false, or so Williamson argues.

Williamson constructs structurally similar cases for the material conditional, for 'for all' and for 'and' (Williamson 2003, 2007, 2011, 2012). His conclusion is that agreement in understanding doesn't require perfect agreement in use. All that is needed for a speaker to understand an expression of *e* is that she fully participate in the social practice of using *e* within her linguistic community. He writes:

> Each individual uses words as words of a public language; their meanings are constitutively determined not individually but socially, through the spectrum of linguistic activity across the community as a whole. The social determination of meaning requires nothing like an exact match in use between different individuals; it requires only enough connection in use between them to form a social practice. Full participation in that practice constitutes full understanding. (Williamson 2007, 91)

Williamson's argument, then, is premised on what is sometimes referred to as *social externalism* (Burge 1979, Burge 1986): linguistic understanding is

always understanding of a public language whose meanings are typically non-individualistically individuated. On the assumption that the community-wide use of 'if' largely conforms to MP, it is this assumption that allows Williamson to maintain that McGee's understanding of 'if' is unaffected by his rejection of certain instances of the rule. How can the inferentialist respond?

We begin with two observations about the *scope* of the argument. To begin, the objection does not target IRS directly. Rather, it aims at undermining a certain account of understanding that can be—and typically is—associated with it. What is more, the argument does not apply to holistic versions of IRS, such as Brandom's. According Brandom's inferentialism, one's understanding of an expression *e* is constituted by one's grasp of the entire network of inferential connections in which *e* participates. But, since such a totality typically slightly varies from speaker to speaker, it may be argued that it is to be *expected*, on Brandom's view, that different speakers understand *e* equally well, and yet associate it with different inferential roles. That being said, however, semantic holism is a highly controversial view (Dummett 1991, Pagin 1997). Let us therefore consider possible lines of response in defence of non-holistic versions of UND.

Boghossian (2012) has recently suggested the following inferentialist response. In his view, McGee understands 'if', but he understands it differently. His deviant use simply shows that he attaches a different meaning to 'if'. As he puts it:

> All that the inferential role theorist is committed to saying is that, if [Vann] succeeds in altering his behavior with ['if'] and flouts a meaning-constituting rule [...], then he necessarily means something different by 'if' [...] It is better to call this "meaning change" rather than incompetence. (Boghossian 2012, 232)

As it stands, however, Boghossian's response is problematic. It is premised on an idiolectic version of MD (see p. 13, fn. 3) which is flatly inconsistent with the social externalism assumed by Williamson's criticism. It may be that such idiolectic conceptions are ultimately more congenial to the inferentialist. Yet, it is an interesting question whether the inferentialist can respond to Williamson on his own terms. While we lack the space to develop a full response, we canvass the general shape such a response might take.

We begin with the observation that Boghossian's meaning-change approach is especially compelling in cases that are very similar to the ones Williamson considers. Consider, for instance, the case of a full-blooded intuitionist and of a classical logician—call them Michael and Tim, respectively—and let us assume that they are both highly proficient logicians. Arguably, Michael and Tim have a different understanding of 'not' (DeVidi and Solomon 2001, Dummett 2007, Dummett 2008).[28] It might be argued, then, that it would be problematic to insist, faced with such a difference, that intuitionist and classical logicians have the same *understanding* of 'not'. After all, intuitionists consciously use 'not' differently. For instance, unlike classical logicians, they refuse to assent to certain instances of the Law of Excluded Middle. It would not do justice to their semantic beliefs to insist that, in spite of their avowed intention to use 'not' according to its intuitionist meaning, 'not' means classical negation in their mouth. Intuitionists *reject* the classical meaning of 'not', and *there is* a coherent, if arguably ultimately untenable, intuitionist meaning of 'not'. The same, it might be contended, applies to the McGee case.

But wouldn't this be, once again, inconsistent with Williamson's social externalism? Here it helps to observe that both Michael and Tim are, we are assuming, experts who have very close to full understanding. What makes them experts is that they are able to make authoritative pronouncements—what Burge (1986) calls 'normative characterizations'—-regarding the criteria for correctly applying expressions related appropriately to their area of competence. They are in the business of *investigating and explicitly articulating the rules we ought to follow*. They are, in Kaplan's distinction, language 'creators' as opposed to be mere 'consumers' (Kaplan 1989, 811). And since they can help shape a linguistic community's linguistic standards, in view of their divergences in the use of 'not', they may be plausibly viewed as belonging to different linguistic communities. It will not do to insist, as Williamson does, that small differences in use don't make a difference in understanding. In the present context, they do. It is only natural that the pronouncements of two experts be carefully examined. Even a small difference in the rules governing the use of an expression *e* is likely to imply a difference in that expression's content, on the natural assumption (shared by all parties) that such a content validates the rules for *e*'s correct use.

So much, then, for experts. What should the inferentialist say about Joe

Shmoe's small but systematic deviance with respect to a given expression *e*? Wouldn't it be patronising to claim that, because he doesn't conform to the community-wide use of *e*, he doesn't understand *e* Williamson 2003, 2007)? Here one should consider two cases. If Joe *defers to experts*, i.e. if, for instance, he is disposed to be corrected by them, then it is open to the inferentialist—in keeping with Williamson's social externalism—to maintain that it is the experts' dispositions that determine *e*'s meaning, and that are constitutive of Joe's understanding of *e*. If, on the other hand, Joe does not defer to experts, and stubbornly insists in using *e* in a deviant way, then it would seem appropriate to say that Joe indeed has an idiosyncratic understanding of *e*: he understands *e* differently.

The inferentialist, then, might respond to Williamson's challenge by insisting that his examples all involve a discrepancy in use among *experts*. Williamson's key argumentative move, the inferentialist might diagnose, is to treat experts as *non-experts*, and to discard, *for this reason*, their idiosyncratic use of certain expressions as irrelevant for those expressions' meaning and understanding. Yet, by the social externalist's own lights, experts—language creators—who use a given expression in different ways, should be credited with *different understandings* of that expression.

If the foregoing considerations are along the right track, it would seem that Williamson's central objection to CRS misses its target after all. To be sure, much more remains to be said. For instance, the inferentialist who pursued a response to Williamson along these lines would have to explain how, for instance, rival logicians might be able to disagree about the validity of what would intuitively seem to be the same logical law. A disagreement about the Law of Excluded Middle, on the foregoing view, would no longer be about whether $A \vee \neg A$ is valid or not, but, say, about whether 'not' and 'or' in English should be interpreted classically or intuitionistically. The question whether this is a plausible feature of the view, or an unpalatable consequence, is, as far as we can see, still very much open.

References

Balcerak Jackson, Brendan. 2009. "Understanding and Semantic Structure: Reply to Timothy Williamson." *Proceedings of the Aristotelian Society*, 109: 337–343. DOI: 10.2307/20619414.

Besson, Corine. 2012. "Logical Knowledge and Ordinary Reasoning." *Philosophical Studies*, 158: 59–82. DOI: 10.1007/s11098-010-9672-3.

Block, Ned. 1986. "Advertisement for a Semantics for Psychology." *Midwest Studies in Philosophy* 10: 615–78. DOI: 10.1111/j.1475-4975.1987.tb00558.x.

Block, Ned. 1987. "Functional Role and Truth Conditions." *Proceedings of the Aristotelian Society*, 61: 157–181.

Block, Ned. 1998. "Conceptual Role Semantics." in *Routledge Encyclopedia of Philosophy* edited by Edward Craig, 242–56. London, Routledge.

Boghossian, Paul. 1996. "Analyticity Reconsidered." *Nous*, 30: 360–391. DOI: 10.2307/2216275.

Boghossian, Paul. 2000. "Knowledge of Logic." in *New Essays on the A Priori* edited by Paul Boghossian and Christopher Peacocke, 229–254. Oxford, Oxford University Press.

Boghossian, Paul. 2003a. "Blind Reasoning." *Proceedings of the Aristotelian Society*, 77, 225–48. DOI: 10.1111/1467-8349.00110

Boghossian, Paul. 2003b. "Epistemic Analyticity: A Defense." *Grazer Philosophische Studien*, 66: 15–35.

Boghossian, Paul. 2011. "Williamson on the A Priori and the Analytic." *Philosophy and Phenomenological Research*, 82: 488–497. DOI: 10.1111/j.1933-1592.2010.00395.x.

Boghossian, Paul. 2012a. "Inferentialism and the Epistemology of Logic: Reflections on Casalegno and Williamson." *Dialectica*, 66: 221–236. DOI: 10.1111/j.1746-8361.2012.01303.x.

Boghossian, Paul. 2012b. "What is inference?" *Philosophical Studies*, 169: 1–18. DOI: 10.1007/s11098-012-9903-x.

Brandom, Robert. 1994. *Making It Explicit*. Cambridge: Harvard University Press.

Brandom, Robert. 2000. *Articulating Reasons*. Cambridge: Harvard University Press.

Brandom, Robert. 2007. "Inferentialism and Some of Its Challenges." *Philosophy and Phenomenological Research*, 74: 651–676. DOI: 10.1111/j.1933-1592.2007.00044.x.

Brandom, Robert. 2008. *Between Saying and Doing: Towards an Analytic Pragmatism* Oxford: Oxford University Press.

Burge, Tyler. 1979. "Individualism and the Mental." *Midwest Studies in Philosophy*, 4: 73–121. DOI: 10.1111/j.1475-4975.1979.tb00374.x

Burge, Tyler. 1986. "Intellectual Norms and Foundations of Mind." *The Journal of Philosophy*, 85: 649–663. DOI: jphil198683121.

Carnap, Rudolf. 1943. *Formalization of Logic*. Cambridge: Harvard University Press.

Casalegno, Paolo. 2004. "Logical Concepts and Logical Inferences." *Dialectica*, 58: 395–411.

Chalmers, D. 2014. *Constructing the World.* Oxford, Oxford University Press.

Chrisman, Matthew. 2010. "From Epistemic Expressivism to Epistemic Inferentialism." In *Social Epistemology*, edited by Adrian Haddock, Alan Millar, Duncan Pritchard, 112–128. Oxford: Oxford University Press.

Chrisman, Matthew. 2015. "Metanormative theory and the meaning of deontic modals." Unpublished manuscript.

Cook, Roy. 2005. "Intuitionism reconsidered." In *The Oxford Handbbook for Philosophy of Mathematics and Logic*, edited by Stewart Shapiro, 387–411. Oxford, Oxford University Press.

Cozzo, Cesare. 1994. "What can we learn from the paradox of knowability?" *Topoi*, 13: 71–78. DOI: 10.1007/BF00763505.

Cozzo, Cesare. 2002. "Does epistemological-holism lead to meaning-holism?" *Topoi*, 21: 25–45. DOI: 10.1023/A:1014876214057

Davidson, Donald. 1984. *Inquiries into Truth and Interpretation*. Oxford: Clarendon Press.

De Vidi, David and Solomon, Graham. 2001. "Knowability and Intuitionistic Logic." *Philosophia*, 28: 319–34. DOI: 10.1007/BF02379783

Dogramaci, Sinan. 2012. "Apriority." In *The Routledge Companion to Philosophy of Language*, edited by Delia Graff-Fara and Gillian Russell (eds), 768–81. London: Routledge.

Dretske, Fred. 2000. *Perception, Knowledge and Belief*. Cambridge: Cambridge University Press.

Dummett, Michael. 1973. *Frege: Philosophy of Language*. London: Duckworth.

Dummett, Michael. 1991. *The Logical Basis of Metaphysics*. Cambridge: Harvard University Press.

Dummett, Michael. 1993. "Wittgenstein on Necessity: Some Reflections." In *The Seas of Language*. Cambridge: Harvard University Press.

Dummett, Michael. 2007. "Reply to Wolfgang Künne." In *The Philosophy of Michael Dummett*, edited by Randall Auxier and Lewis Hahn, 345–50. Chicago: Open Court.

Dummett, Michael. 2009. "Fitch's Paradox of Knowability." In *New Essays on the Knowability Paradox*, edited by Joe Salerno, 51–2. Oxford: Oxford University Press.

Eklund, Matti. 2007. "Meaning-Constitutivity." *Inquiry*, 50: 559–74. DOI: 10.1080/00201740701698506.

Field, Hartry. 1977. "Logic, Meaning, and Conceptual Role." *Journal of Philosophy*, 74: 379–409. DOI: 10.2307/2025580.

Field, Hartry. 1994. "Are Our Logical and Mathematical Concepts Highly Indeterminate?". *Midwest Studies in Philosophy*, 19: 391–429. DOI: 10.1111/j.1475-4975.1994.tb00296.x.

Field, Hartry. 2001. "Attributions of Meaning and Content." In *Truth and the Absence of Fact.*, 157–74. Oxford: Clarendon Press.

Fodor, Jerry. 1991. *A Theory of Content.* Cambridge: MIT Press.

Fodor, Jerry and Lepore, Ernest. 1991. "Why Meaning (Probably) Isn't Conceptual Role." *Mind and Language*, 6: 328–43. DOI: 10.1111/j.1468-0017.1991.tb00260.x.

Fodor, Jerry and Lepore, Ernest. 2001. "Brandom's Burdens: Compositionality and Inferentialism." *Philosophy and Phenomenological Research*, 63: 465–81. DOI: 10.2307/3071079.

Fodor, Jerry and Lepore, Ernest. 2010. "Brandom Beleaguered". In *Reading Brandom*, edited by Bernard Weiss and Jeremy Wanderer, 181–94. Abingdon: Routledge.

Garson, James. 2001. "Natural Semantics: Why Natural Deduction is Intuitionistic." *Theoria*, 67: 114–137. DOI: 10.1111/j.1755-2567.2001.tb00200.x.

Gentzen, Gerhard. 1934. "Untersuchungen über das logischen Schließen." *Mathematische Zeitschrift*, 39: 405–31.

Hacking, Ian. 1979. "What is Logic?" *Journal of Philosophy*, 76: 285–319. DOI: 10.2307/2025471.

Harman, Gilbert. 1987. "(Nonsolipsistic) Conceptual Role Semantics." In *New Directions in Semantics*, edited by Ernest Lepore, 242–256. Waltham: Academic Press.

Harman, Gilbert. 1999. *Reasoning, Meaning and Mind*. Oxford: Oxford University Press.

Harman, Gilbert. 1993. "Meaning Holism Defended." *Grazer Philosophische Studien*, 46: 163–171. DOI: 10.5840/gps1993467.

Harman, Gilbert and Greenberg, Mark. 2006. "Conceptual Role Semantics." In *The Oxford Handbook of Philosophy of Language*, edited by Ernest Lepore and Barry Smith, REF. Oxford: Oxford University Press.

Hodes, Harold. 2004. "On the Sense and Reference of a Logical Constant." *The Philosophical Quarterly*, 54: 134–65. DOI: 10.1111/j.0031-8094.2004.00345.x.

Horwich, Paul. 1998. *Meaning*. Oxford: Oxford University Press.

Horwich, Paul. 2005. *Reflections on Meaning*. Oxford: Oxford University Press.

Incurvati, Luca and Smith, Peter. 2010. "Rejection and Valuations." *Analysis*, 69: 3–10. DOI: 10.2307/23315071.

Kaplan, David. 1989a. "Afterthoughts." In *Themes from Kaplan*, edited by Joseph Almog, John Perry and Howard Wettstein, 565–614. Oxford: Oxford University Press.

Kaplan, David. 1989b. "Demonstratives." In *Themes from Kaplan*, edited by Joseph Almog, John Perry and Howard Wettstein, 565–614. Oxford: Oxford University Press.

Kneale, William. 1956. "The Province of Logic." In *Contemporary British Philosophy*, edited by H. D. Lewis, 237–61. London: George Allen & Unwin Ltd.

Loar, Brian 1981. *Mind and Meaning*. Cambridge: Cambridge University Press.

MacFarlane, John. 2005. "Logical constants." In *Stanford Encyclopedia of Philosophy* (Fall 2015 Edition), edited by Edward Zalta. URL = <http://plato.stanford.edu/archives/fall2015/entries/logical-constants/>.

MacFarlane, John. 2010. "Pragmatism and Inferentialism." In *Reading Brandom*, edited by Bernard Weiss and Jeremy Wanderer, 81–96. Abingdon: Routledge.

McGee, Vann. 1985. "A Counterexample to Modus Ponens." *The Journal of Philosophy*. 82: 462–71. DOI: jphil198582937.

Murzi, Julien and Steinberger, Florian. 2013. "Is Knowledge of Logic Dispositional?" *Philosophical Studies*. 166: 165–83. DOI: 10.1007/s11098-012-0063-9.

Pagin, Peter. 1997, "Is Compositionality Compatible with Holism?" *Mind and Lan- guage*,12: 11–33. DOI: 10.1111/1468-0017.00034.

Pagin, Peter. Forthcoming. "Intuitionism and the Anti-Justification of Bivalence." In *Logicism, Intuitionism, and Formalism: What has Become of Them?*, edited by Sten Lindström et. al. Dordrecht: Synthese Library, Springer.

Parsons, Terence. 1984. "Assertion, Denial and the Liar Paradox." *Journal of Philosophical Logic*, 13: 136–52. DOI: 10.1007/BF00453019.

Peacocke, Christopher. 1992. *A Study of Concepts*. Cambridge: MIT Press.

Popper, Karl. 1947. "New Foundations for Logic." *Mind*, 56: 193–235. DOI: 10.1093/mind/LVI.223.193.

Prawitz, Dag. 1965. *Natural Deduction*. Stockholm: Almqvist and Wiksell.

Prawitz, Dag. 1974. "On the Idea of a General Proof Theory." *Synthese*, 27: 63–77. DOI: 10.1007/BF00660889.

Prawitz, Dag. 1977. "Meaning and Proofs: On the Conflict Between Classical and Intuitionistic Logic. *Theoria*, 43: 1–40. DOI: 10.1111/j.1755-2567.1977.tb00776.x.

Prawitz, Dag. 1985. "Remarks on Some Approaches to the Concept of Logical Consequence." *Synthese*, 62: 153–71. DOI: 10.1007/BF00486044.

Prior, Arthur. 1960. "The Runabout Inference-Ticket." *Analysis*, 21: 38–9. DOI: 10.1093/analys/21.2.38.

Putnam, Hillary. 1975. "The Meaning of Meaning." In *Mind, Language and Reality* Cambridge University Press, Cambridge.

Putnam, Hilary. 1981. *Realism, Truth and History*, Cambridge: Cambridge University Press.

Raatikainen, Panu. 2008. "On rules of inference and the meanings of logical constants." *Analysis*, 68(4): 282–87. DOI: 10.1111/j.1467-8284.2008.00754.x.

Read, Stephen. 2000. "Harmony and autonomy in classical logic." *Journal of Philosophical Logic*, 29: 123–54. DOI 10.1023/A:1004787622057.

Reiss, Julian. 2012. "Causation in the sciences: an inferentialist account." *Studies in the history and philosophy of biological and biomedical sciences* 43: 769–77. DOI 10.1016/j.shpsc.2012.05.005.

Restall, Greg. 2005. "Multiple conclusions." In *Logic, Methodology and the Philosophy of Science: Proceedings of the Twelfth International Congress*, edited by L. V.-V. Petr Hajek and Dag Westerthal, 189–205. London: King's College Publications.

Rosen, Gideon, 1997. "Who makes the rules around here?" *Philosophy and Phenomenological Research* 57(1): 163–71. DOI 10.2307/2953786

Rumfitt, Ian. 2000. "'Yes' and 'No'." *Mind* 109: 781–824. DOI 10.1093/mind/109.436.781.

Russell, Gillian. 2014. "Metaphysical analyticity and the epistemology of logic." *Philosophical Studies* 171: 161–175. DOI 10.1007/s11098-013-0255-y.

Salerno, Joe, ed. 2009. *New Essays on the Knowability Paradox*. Oxford: Oxford University Press.

Schechter, Joshua and David Enoch. 2006. "Meaning and justification: The case of modus ponens." *Nous* 40: 687–715. DOI 10.2307/4093984.

Sellars, Wilfrid. 1953. "Inference and meaning." *Mind* 62: 313-38. DOI 10.1093/mind/LXII.247.313.

Sellars, Wilfrid. 1956. "Empiricism and the philosophy of mind." *Minnesota Studies in The Philosophy of Science: The Foundations of Science and the Concepts of Psychology and Psychoanalysis I*, 253-329. Minneapolis: University of Minnesota Press.

Shapiro, Lionel. 2004. "Brandom on the normativity of meaning." *Philosophy and Phenomenological Research* 68(1): 141-60. DOI 10.1111/j.1933-1592.2004.tb00330.x.

Shoesmith, D. J. and Timothy Smiley. 1978. *Multiple-conclusion logic*. Cambridge: Cambridge University Press.

Smiley, Timothy. 1996. "Rejection." *Analysis* 56(1): 1–9. DOI 10.1111/j.0003-2638.1996.00001.x.

Stalnaker, Robert. 1997. "Reference and necessity." In *A Companion to the Philosophy of Language*, edited by Bob Hale and Crispin Wright, 534-54. Oxford: Basil Blackwell.

Stanley, Jason. 2007. *Language in Context*. Oxford: Oxford University Press.

Steinberger, Florian. 2009. *Harmony and logical inferentialism*. PhD thesis, University of Cambridge, Cambridge.

Steinberger, Florian. 2011a. "What harmony could and could not be." *Australasian Journal of Philosophy* 89(4): 617-639. DOI 10.1080/00048402.2010.528781.

Steinberger, Florian. 2011b. "Why conclusions should remain single." *Journal of Philosophical Logic* 40(3): 333-355. DOI 10.2307/41487518.

Suarez, Mauricio. 2004. "An inferential conception of scientific representation." *Philosophy of Science* 71: 767-779. DOI 10.1086/421415.

Tennant, Neil. 1987. *Anti-realism and Logic*. Oxford: Clarendon Press.

Tennant, Neil. 1997. *The Taming of the True*. Oxford: Oxford University Press.

Tennant, Neil. "Inferentialism, logicism, harmony, and a counterpoint." Forthcoming in *Essays for Crispin Wright: Logic, Language and Mathematics*, edited by Alex Miller. Oxford: Oxford University Press.

Warren, Jarred. 2015. "The possibility of truth by convention." *The Philosophical Quarterly* 65: 84-93. DOI 10.1093/pq/pqu051.

Wedgwood, Ralph. 2007. *The Nature of Normativity*. Oxford: Oxford University Press.

Weiss, Bernhard and Wanderer, Jeremy eds. 2010. *Reading Brandom*. Abingdon: Routledge.

Whiting, Daniel. 2006. "Conceptual role semantics." *Internet Encyclopedia of Philosophy*.

Whiting, Daniel. 2008. "Meaning holism and de re ascription." *Canadian Journal of Philosophy* 38: 575-599. DOI 10.1353/cjp.0.0033.

Whiting, Daniel. 2009. "On epistemic conceptions of meaning: Use, meaning and normativity." *European Journal of Philosophy* 17: 416-434. DOI 10.1111/j.1468-0378.2008.00320.x.

Williamson, Timothy. 2003. "Blind reasoning: understanding and inference." *Proceedings of the Aristotelian Society* 77(1): 249-293. DOI 10.1111/1467-8349.00111.

Williamson, Timothy. 2006. "Conceptual truth." *Proceedings of the Aristotelian Society* 80: 1-41. DOI 10.1111/j.1467-8349.2006.00136.x.

Williamson, Timothy. 2007. *The Philosophy of Philosophy*. Oxford: Oxford University Press.

Williamson, Timothy. 2009. "Reference, inference and the semantics of pejoratives." In *The Philosophy of David Kaplan*, edited by Joseph Almog and Paolo Leonardi, 137-158. Oxford: Oxford University Press.

Williamson, Timothy. 2010. "Review of Robert Brandom, Reason in Philosophy: Animating Ideas." *Times Literary Supplement* 5579: 22-23.

Williamson, Timothy. 2011. "Reply to Boghossian." *Philosophy and Phenomenological Research* 82(2): 498-506. DOI 10.1111/j.1933-1592.2010.00400.x.

Williamson, Timothy. 2012. "Boghossian and Casalegno on understanding and inference." *Dialectica* 66(2): 237-247. DOI 10.1111/j.1746-8361.2012.01295.x.

Further reading

Brandom, Robert. 2000. *Articulating Reasons*. Cambridge: Harvard University Press. An accessible introduction to the most worked out global inferentialist position.

Dummett, Michael. 1991. *The Logical Basis of Metaphysics*. Cambridge: Harvard University Press. A difficult, but rewarding exploration of semantic anti-realism. Chapter 11, in particular, has proved influential for the program of logical inferentialism.

Tennant, Neil. 1997. *The Taming of the True*. Oxford: Oxford University Press. A carefully argued book-length treatment of the motivations for and the ramifications of (logical) inferentialism.

Williamson, Timothy. 2007. *The Philosophy of Philosophy*. Oxford: Oxford University Press. An important book on the methodology of philosophy. Chapter 4 contains challenging objections to inferentialism and use-theories of meaning in general.

Notes

[1]Stalnaker (1997) uses the labels 'descriptive semantics' and 'foundational semantics' to make the same distinction. We follow the terminology in Kaplan (1989), which by now is fairly well established. Brandom's labels 'formal semantics' and 'philosophical semantics' seem to designate the same distinction. See Brandom (1994, 143) and Weiss and Wanderer (2010, 342). for formulations of Brandom's distinction.

[2]The level of thought is treated analogously:

(CD) *Content determination*. The contents of concepts are determined by their role in inference.

(GRA) *Grasping*. To grasp a concept is to know its role in inference.

[3]See e.g. Brandom's deflationary notions of reference and truth in his (1994), as well as the discussion between Dummett and Brandom (Weiss and Wanderer, 2010, Ch. 13 & 29).

[4]That said, certain local forms of IRS do proclaim a (local) atomism. Neil Tennant (1987, 1997), for instance, argues for a form of atomistic IRS about logical concepts. On such a view, the meaning of any logical operator is independent of that of the other other logical operators (indeed independent of any other expressions). Analogously, understanding a logical operator does not presuppose antecedent understanding of any other logical operators.

[5]But see our discussion of Brandom's holism in §3 below.

[6]Block (1986), Loar (1981), Harman (1999), Peacocke (1992) belong to this camp.

[7]Proponents of normative versions of IRS include Boghossian (2003), Brandom (1994), Dummett (1991), Wedgwood (2007), Whiting (2009).

[8]See e.g. Popper (1947, 220), Kneale (1956, 254-5), and Dummett (1991, 247).

[9]Dummett correctly observes that while

> it may [...] be that the [representational] meanings of the logical constants [i.e. the truth-functions they denote] are *determined* by the logical laws that govern their use in deductive arguments [...] this cannot be assumed—it needs to be *shown*. (Dummett 1991, 205)

Carnap (1943) first showed that, in standard natural deduction systems, the rules for $\vee$, $\neg$, and $\rightarrow$ fail to determine their standard truth-conditions. Thus, it would seem, standard natural deduction systems are not hospitable at least to certain interpretations of MD. However, while this is sometimes thought to be a problem (see e.g. Raatikainen 2008), it need not be. For one thing, on certain assumptions, the rules still determine the standard *intuitionistic* meanings of $\vee$, $\neg$, and $\rightarrow$ (Garson 2001). For another, in slightly less standard, though arguably equally 'natural', natural deduction systems, the classical I- and E-rules for $\vee$, $\neg$, and $\rightarrow$ *do* determine their truth-conditions (see e.g. Smiley 1996, Rumfitt 2000)

[10]For instance, a connective $\odot$ satisfying the standard I-rules for $\wedge$ but only one of its E-rules would be intrinsically harmonious, and yet intuitively disharmonious: its E-rule would not allow us to infer from $A \odot B$ all that was required to introduce $A \odot B$ in the first place.

[11]Right-to-left: suppose B follows from A. Since A also follows from $\mathcal{CG}[A]$, B itself follows from $\mathcal{CG}[A]$. Left-to-right: suppose B follows from $\mathcal{CG}[A]$. Now assume A. By the Fundamental Assumption, $\mathcal{CG}[A]$ itself follows. Hence, on our assumption that B follows from $\mathcal{CG}[A]$, we may conclude B, as required.

[12]Whether harmony is also a *sufficient* condition for logicality is a more delicate question. See Read (2000).

[13]See also e.g. Hacking (1979, 237-8) and Dummett (1991, 217-18), and the discussion in Steinberger (2011a).

[14]Alternatively, harmonious axiomatisations of classical logic can be given once *multiple conclusions* are allowed (Read 2000, Cook 2005), either in a natural deduction or in a sequent-calculus setting. Sequent calculi axiomatisations of intuitionistic and classical logic are exactly alike, except that classical sequent calculi allow for sequents with multiple premises *and* multiple conclusions. In turn, such sequents can be plausibly interpreted as saying that one may not assert all the antecedents and deny all the succedents, where, again, assertion and denial are both primitive speech acts (Restall 2005). For a technical introduction to multiple-conclusion logics, see ShoesmithSmiley (1978). For a recent criticism, see Steinberger (2011b).

[15]We should stress that Brandom is but one proponent of a global form of inferentialism. For some representative publications on various global brands of CRS, see e.g. Sellars (1956), Harman (1987), Field (1977, 1994, 2001), Block1987, Block (1998), Cozzo (1994), Horwich (1998), Peacocke (1992), Boghossian (2003, 2003a, 2012, 2012a), Whiting (2006, 2008, 2009), Chalmers (2014). For reasons of space, we only focus on Brandom's work, on account of its influence, and of the detail in which the views have been worked out over the years.

[16]For a criticism of Brandom's deflationary approach see Shapiro (2004). See MacFarlane (2010) for an interesting objection to Brandom's assumption that a use-theoretic approach is incompatible with a truth-conditional approach.

[17]As we noted in section §2, there will be extremal cases—language-entry rules—in which the grounds for inferring a sentence may be perceptual; and in which the consequences of asserting a sentences will be non-linguistic.

[18]Brandom explicitly follows Sellars on this point Brandom (1994, 97).

[19]See in particular Brandom's discussion of Dummett's inferentialist treatment of pejoratives Brandom (2000, 69ff). See Williamson (2009) for a stern referentialist reprisal.

[20]The exchange between Hale and Wright and Brandom is illuminating in this regard. See WeissWanderer (2010, Ch. 17 & Ch. 33).

[21]For an impression of the breadth of criticisms inspired by his Brandom (1994) alone, readers may consult, e.g. the book symposium in a special issue of *Philosophy and Phenomenological Research* (Vol. 57, No. 1, 1997), of and Weiss and Wanderer (2010).

[22]For more discussion on semantic holism, see e.g. Dummett (1991), Harman (1993), Pagin (1997, 2006), Cozzo (2002).

[23]See Brandom (1994, 666) for more detailed discussion.

[24]For an incomplete sample, see e.g. Fodor and Lepore (1991), Casalegno (2004), Williamson (2003), Williamson (2007), Williamson (2009), Williamson (2012), Horwich (2005), Besson

(2010), Enoch and Schechter (2006), Dogramaci (2012). For some inferentialist responses beyond the ones cited below, see e.g. Eklund (2007), Balcerak Jackson (2009), and Murzi and Steinberger (2013).

[25]The same point is also forcefully made, *inter alia* in Jason Stanley's introduction to Stanley (2007).

[26]See also Williamson (2007, 282).

[27]If McGee is right, and 'if' actually does not satisfy MP, contrary to what we're assuming, then expert speakers who infer according to the unrestricted rule of MP would serve as purported counterexamples to UND.

[28]Intuitionist and classical negation (respectively, $\sim$ and $\neg$) have different meanings on most intuitionist semantics. For instance, on the standard BHK semantics $\sim A$ means that there is no proof of A, i.e. that it is *impossible* to prove A. Given the intuitionist's equation of truth with the existence of a proof, the impossibility of proving A in turn entails that A *can't* be true. Similarly, on the standard Kripke semantics for intuitionist logic, $\sim A$ is forced by a state of information w if and only if *no possible development* of w forces A. This modal component is arguably absent in classical negation (DeVidi and Solomon 2001, Dummett 2007, Dummett 2008).

Julien Murzi completed his PhD at the University of Sheffield in October 2010. He is Assistant Professor at the University of Salzburg, having previously been a post-doctoral fellow at the Munich Center for Mathematical Philosophy (of which he continues to be an external member) and Lecturer in Philosophy at the University of Kent. He has published papers on inferentialism, logical consequence, the semantic paradoxes, the realism/anti-realism debate, and the open future.

Florian Steinberger completed his PhD at the University of Cambridge in 2009. He subsequently held a Junior Research Fellowship at Queens' College, Cambridge. Before being appointed to his current job as Lecturer at Birkbeck College, he was an Assistant Professor in Logic and Philosophy of Language at Ludwig-Maximilians University, Munich and the Munich Center for Mathematical Philosophy of which he continues to be an external member. His research interests are primarily in the philosophies of logic and language and in epistemology.